

3.3.7.3 Hemlock Relict

3.3.7.3.1 Community Overview

Hemlock relicts are small patches of mesic forest composed mostly of species that are disjunct from and generally far south of their usual Wisconsin ranges. Most documented relicts occur in southwestern Wisconsin's Driftless Area, within the Western Coulees and Ridges Ecological Landscape. Typical sites are deep, steep-sided, moist ravines, with cool northern or eastern slope exposures. Exposures of bedrock, most often Cambrian sandstones, are typically present, and contribute to the ability of this community to develop and persist in areas that would otherwise be vegetated with deciduous hardwood forests. The porous sandstone has a high capacity to hold water, which slowly moves through the rock and keeps conditions humid and cool. The dominant tree is most frequently eastern hemlock. Eastern white pine, yellow birch, and paper birch are common "northern" canopy associates. Other trees present are usually those that are present in the adjoining hardwood forests. Shrubs and herbs with northern affinities are important, and may include mountain maple, Canada yew, showy mountain ash, blue-bead lily, rosy twisted-stalk, shining club-moss, and spinulose wood fern. The dense shade of the hemlock, combined with the northern aspect of many stands, means that very little light reaches the forest floor. The groundlayer is often very sparse.

Hemlock relicts are highly localized, and not randomly or widely distributed in southwestern Wisconsin. They are concentrated in a few areas, such as the drainages of the upper Kickapoo and Baraboo Rivers, and in a few of the deep gorges that cut into the flanks of the Baraboo Hills. Extremely isolated outliers are known from a few sites south of the Wisconsin River. Unusual plants and animals have been documented in a number of stands. These include "periglacial" relicts, that for various reasons were unable to keep pace with changes to the vegetation as the climate changed following the last glacial advance, and a number of habitat specialists that are rare elsewhere in southern Wisconsin.

3.3.7.3.2 Vertebrate Species of Greatest Conservation Need Associated with Hemlock Relict

Seven vertebrate Species of Greatest Conservation Need were identified as moderately associated with hemlock relicts (Table 3-148). There were not any vertebrate Species of Greatest Conservation Need that were identified as significantly associated with hemlock relict communities.

Table 3-148. Vertebrate Species of Greatest Conservation Need that are (or historically were) moderately associated with hemlock relict communities.

Birds

Veery

Canada Warbler

Mammals

Northern Long-eared Bat

Silver-haired Bat

Eastern Red Bat

Hoary Bat

Northern Flying Squirrel


In order to provide a framework for decision-makers to set priorities for conservation actions, the species identified in Table 3-148 were subject to further analysis. The additional analysis identified the best opportunities, by Ecological Landscape, for protection, restoration, and/or management of both hemlock relict and associated vertebrate Species of Greatest Conservation Need. The steps of this analysis were:


- Each species was examined relative to its probability of occurrence in each of the 16 Ecological Landscapes in Wisconsin. This information was then cross-referenced with the opportunity for protection, restoration, and/or management of hemlock relict in each of the Ecological Landscapes (Table 3-149).


Table 3-149. Vertebrate Species of Greatest Conservation Need that are (or historically were) *moderately* associated with hemlock relict communities and their association with Ecological Landscapes that support hemlock relicts.

Hemlock Relict	Birds (2)*		Mammals (5)				
	Veery	Canada Warbler	Northern Long-eared Bat	Silver-haired Bat	Eastern Red Bat	Hoary Bat	Northern Flying Squirrel
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type							
MAJOR							
Western Coulee and Ridges							
PRESENT (MINOR)							
Central Sand Plains							
Southwest Savanna							

Color Key

 = HIGH probability the species occurs in this Ecological Landscape

 = MODERATE probability the species occurs in this Ecological Landscape

 = LOW or NO probability the species occurs in this Ecological Landscape

* The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.

3.3.7.3.3 Threats and Priority Conservation Actions for Hemlock Relict

3.3.7.3.3.1 Statewide Overview of Threats and Priority Conservation Actions for Hemlock Relict

The following list of threats and priority conservation actions were identified for hemlock relict in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.7.3.3.2 unless otherwise indicated.

Threats and Issues

- Disruption to the factors that are responsible for maintaining the special microclimatic conditions (hydrology, deep shade) of the relicts can cause the loss of northern species near their southern range limits, as well as some of the habitat specialists.
- The isolation of most of the relict stands can be problematic, as species lost from a given site may not be capable of recolonizing that site. The removal of forest cover from lands around and between the relicts can exacerbate this situation, and also render sites unsuitable for species with relatively large area requirements, or that are vulnerable to edge effects.
- Grazing, logging, and invasive herbs such as garlic mustard are also threats to the integrity of these unusual communities.
- Heavy recreational use by horses, mountain bikes, and even hikers can lead to rapid erosion of the steep slopes and fragile, sometimes springy, and sparsely vegetated soils characteristic of this community.
- Hemlock is reproducing surprisingly well in some of these southern stands, but evidence of excessive browse pressure from white-tailed deer is obvious at other sites.

Priority Conservation Actions

- High levels of protection are warranted for sites that are known to support intact communities and rare species populations. Use a variety of means, including acquisitions, easements, and designations, to protect known sites of high ecological value.
- On public lands, avoid routing recreational trails through hemlock relicts when possible. When that can't be avoided, monitor carefully for evidence of erosion, browse damage, and infestation by invasive plants.
- Encourage protection of significant sites on private lands by developing appropriate incentive programs.
- Additional survey work for selected taxa is warranted for this type, especially for some of the groups that are less well known, such as lichens, mosses, ferns, and invertebrates.

3.3.7.3.3.2 Additional Considerations for Hemlock Relict by Ecological Landscape

Special considerations have been identified for those Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of hemlock relict exist. Those considerations are described below and are in addition to the statewide threats and priority conservation actions for hemlock relict found in Section 3.3.7.3.3.1.

Additional Considerations for Hemlock Relict in Ecological Landscapes with **Major** Opportunities for Protection, Restoration, and/or Management of Hemlock Relict

Western Coulees and Ridges

This community may be seen at Mt. Pisgah Hemlock-Hardwoods State Natural Area in Wildcat Mountain State Park (Vernon County), within the Kickapoo Reserve (Bridge 8 Woods and Cliffs State Natural Area, Vernon County), and at Hemlock Draw (Sauk County).

Additional Considerations for Hemlock Relict in Ecological Landscapes with **Important** Opportunities for Protection, Restoration, and/or Management of Hemlock Relict

Central Sand Plains

This community occurs locally at the extreme southern edge of this Ecological Landscape, for example Blackhawk Island in the Dells of the Wisconsin River (Juneau County), and Witches Gulch (Adams County).